What is claimed is:

1. A driving method for an optical printer that drives a plurality of light emitting elements to emit light in accordance with image data, for recording pixels of different densities on a photosensitive recording medium to form a grayscale image, the method comprising the steps of:

controlling time lengths of lighting the individual light emitting elements in accordance with tonal levels of pixels to print that are represented by the image data; and

simultaneously changing luminance of the respective light emitting elements according a predetermined characteristic curve as the lighting time for each pixel elapses.

2. A driving method as claimed in claim 1, wherein the photosensitive recording medium is a self-developing type photo film unit, and the luminance of the respective light emitting elements is raised as the lighting time for each pixel elapses.

3. A driving method as claimed in claim 1 or 2, wherein the luminance of the light emitting elements are changed with time at a constant rate from a constant initial value for each pixel, whereas a lighting time length for each tonal level is determined by the initial value and changing rate of the luminance of the light emitting elements and coloring characteristics of the photosensitive recording medium.

4. A driving method as claimed in claim 1 or 2, wherein the lighting time lengths of the individual light emitting elements are changed proportionally to the tonal levels of the pixels to print, whereas the luminance of the light emitting elements are changed with time for recording each pixel according to a non-linear curve that is determined by the lighting time lengths for the individual tonal levels and coloring characteristics of the photosensitive recording medium.

5. A driving method as claimed in claim 1, further comprising the steps of moving a printing head that has the plurality of light emitting elements aligned along a main scan direction, and the photosensitive recording material relative to each other in a sub scan direction perpendicular to the main scan direction, for recording the image line by line.

6. A driving method as claimed in claim 1, wherein the light emitting elements are driven a number N of times of a constant unit time for recording each pixel, the number N being 0 or an positive integer and varied depending upon the tonal level of the pixel to print, to control the lighting time lengths.

7. An optical printer for printing a grayscale image on a photosensitive recording medium based on image data, the optical printer comprising:

a printing head having a plurality of light emitting elements arranged in a main scan direction, for projecting light beams toward the photosensitive recording medium;

a driving device for driving the light emitting elements while controlling time lengths of driving the individual light emitting elements per each pixel in accordance with tonal levels of pixels to print that are represented by the image data;

a control device for changing luminance of the light emitting elements according a predetermined characteristic curve as the driving time for each pixel elapses; and

a scanning device for shifting the printing head relative to the photosensitive recording medium in a sub scan direction perpendicular to the main scan direction after each line of the image is recorded on the photosensitive recording medium.

8. An optical printer as claimed in claim 7, wherein the printing head is a fluorescent display panel that contains an array of the light emitting elements in a vacuum container, wherein luminance of the light emitting element is variable depending upon drive voltage applied thereto, and the control device controls the drive voltage according the predetermined characteristic curve as the driving time for each pixel elapses.

9. An optical printer as claimed in claim 8, wherein the photosensitive recording medium is a self-developing type photo film unit, and the control device raises the drive voltage as the driving time for each pixel elapses.